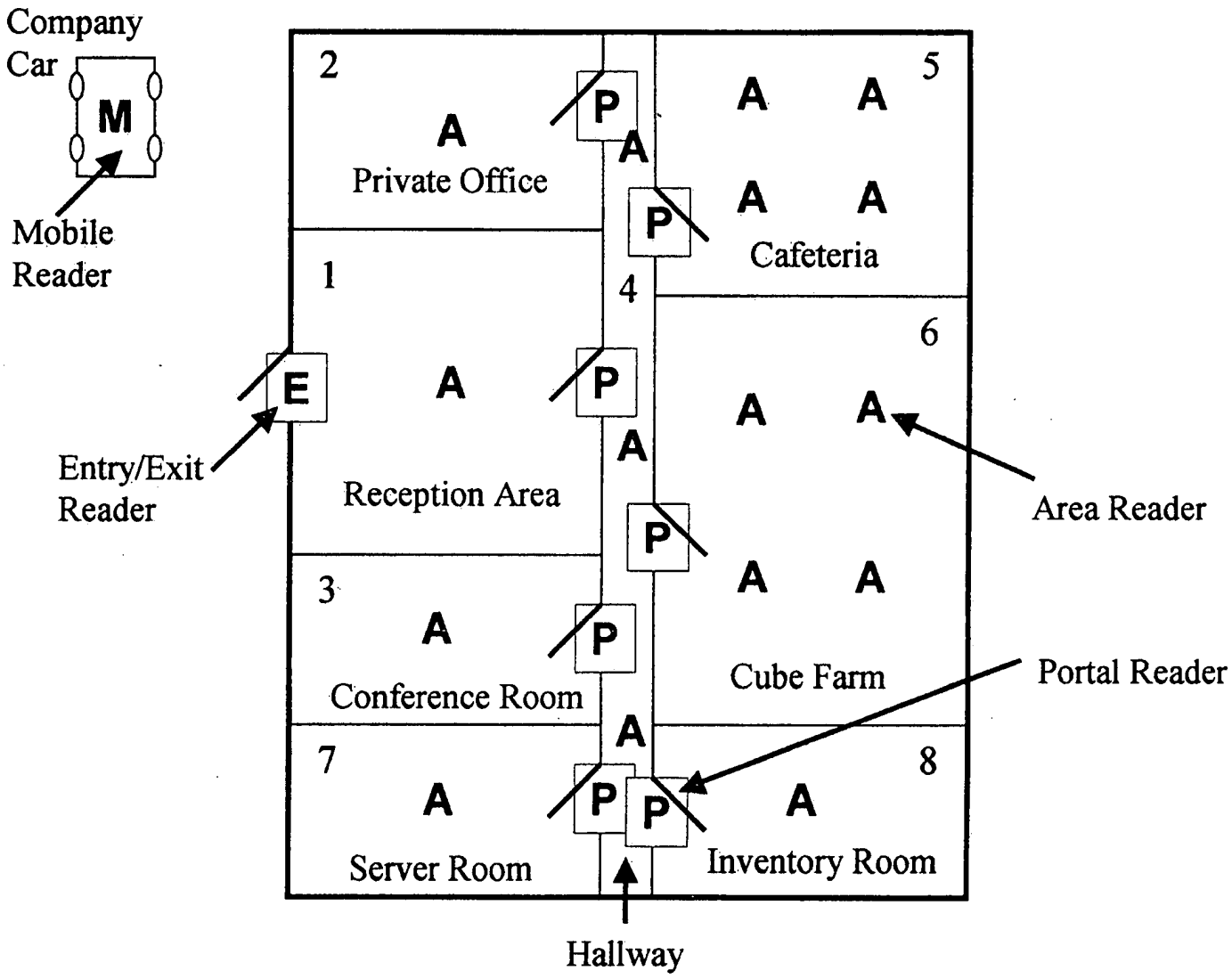

Company
Car
M
Mobile
Reader
2
Private Office
5
Cafeteria
1
4
6
E
Entry/Exit
Reader
Reception Area
Area Reader
3
Conference Room
Cube Farm
Portal Reader
7
Server Room
8
Inventory Room
Hallway
A
P

Figure 1

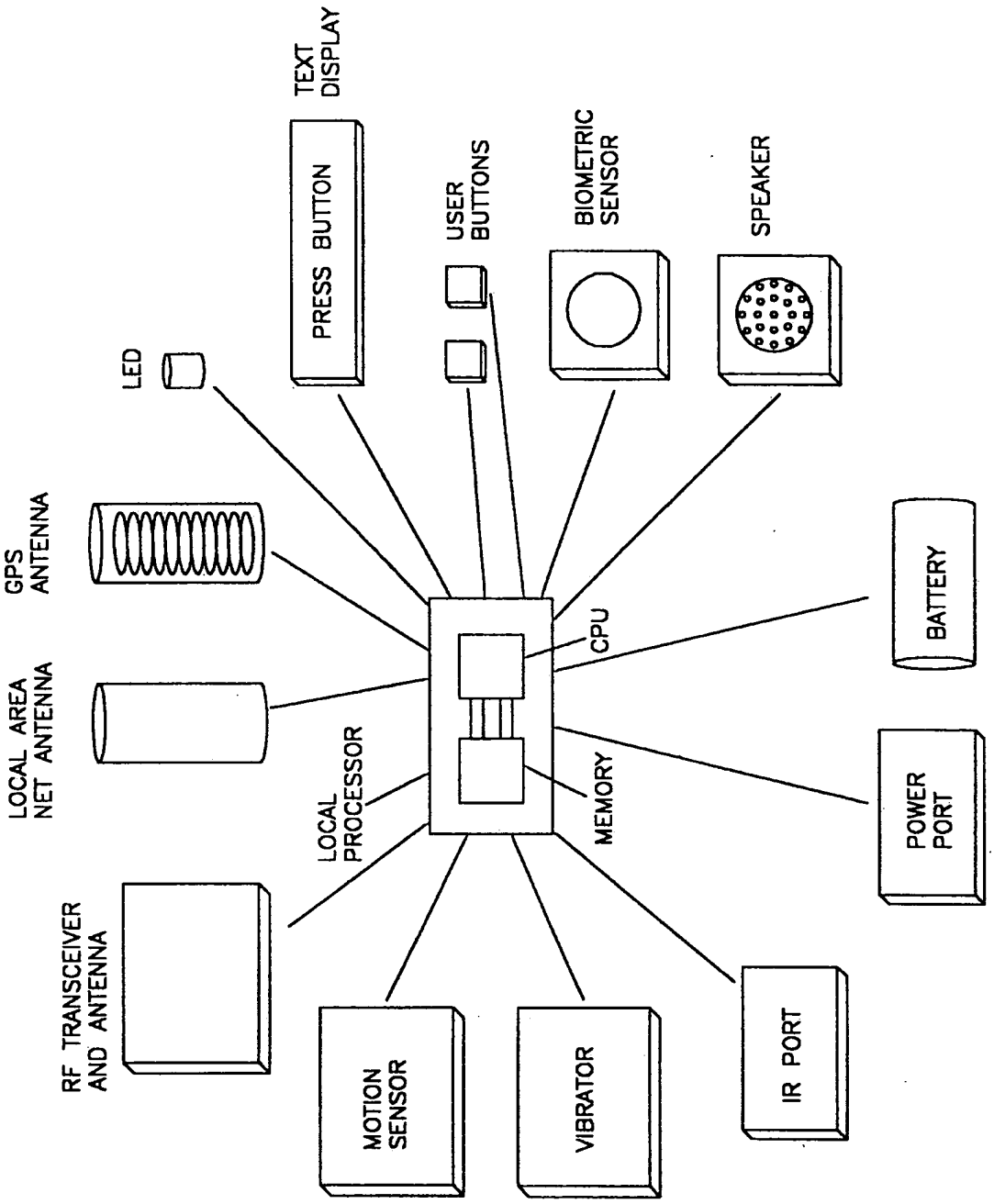

TEXT DISPLAY
PRESS BUTTON
USER BUTTONS
BIOMETRIC SENSOR
SPEAKER
LED
GPS ANTENNA
LOCAL AREA NET ANTENNA
CPU
BATTERY
LOCAL PROCESSOR
MEMORY
POWER PORT
RF TRANSCEIVER AND ANTENNA
MOTION SENSOR
VIBRATOR
IR PORT

Figure 2

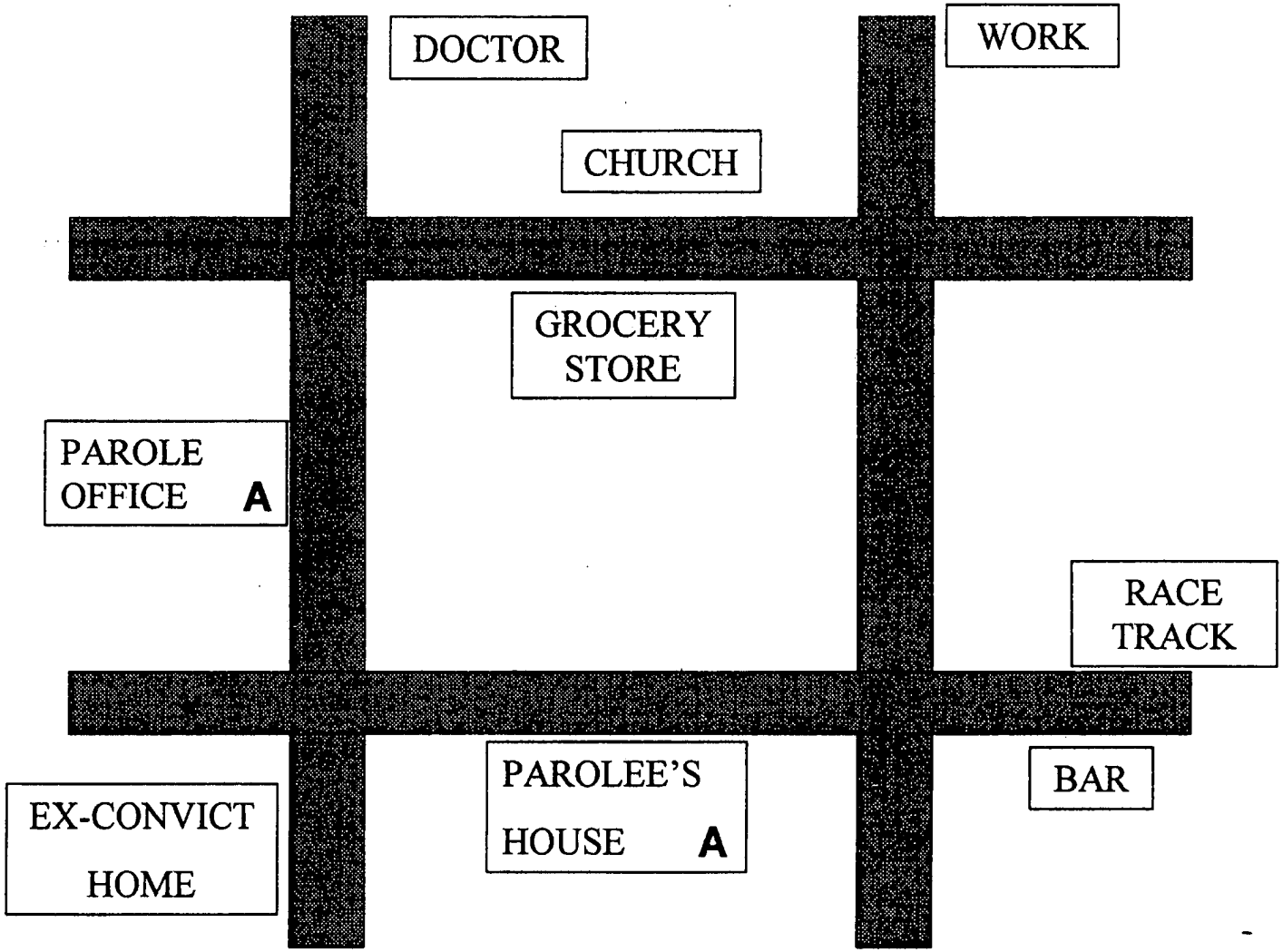

DOCTOR
WORK
CHURCH
GROCERY STORE
PAROLE OFFICE A
RACE TRACK
PAROLEE'S HOUSE A
BAR
EX-CONVICT HOME

Figure 3

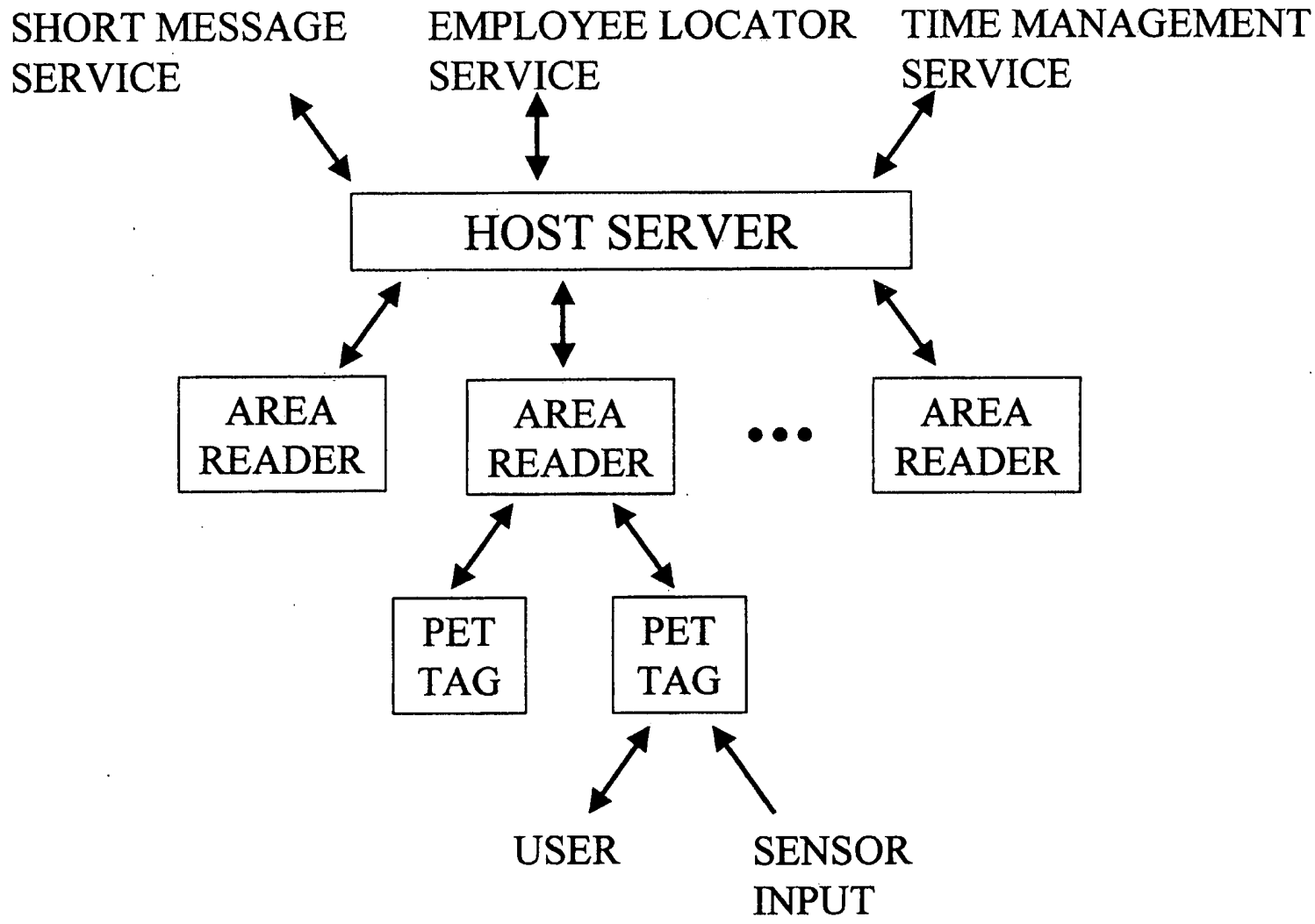

SHORT MESSAGE SERVICE
EMPLOYEE LOCATOR SERVICE
TIME MANAGEMENT SERVICE
HOST SERVER
AREA READER
AREA READER
AREA READER
PET TAG
PET TAG
USER
SENSOR INPUT

Figure 4

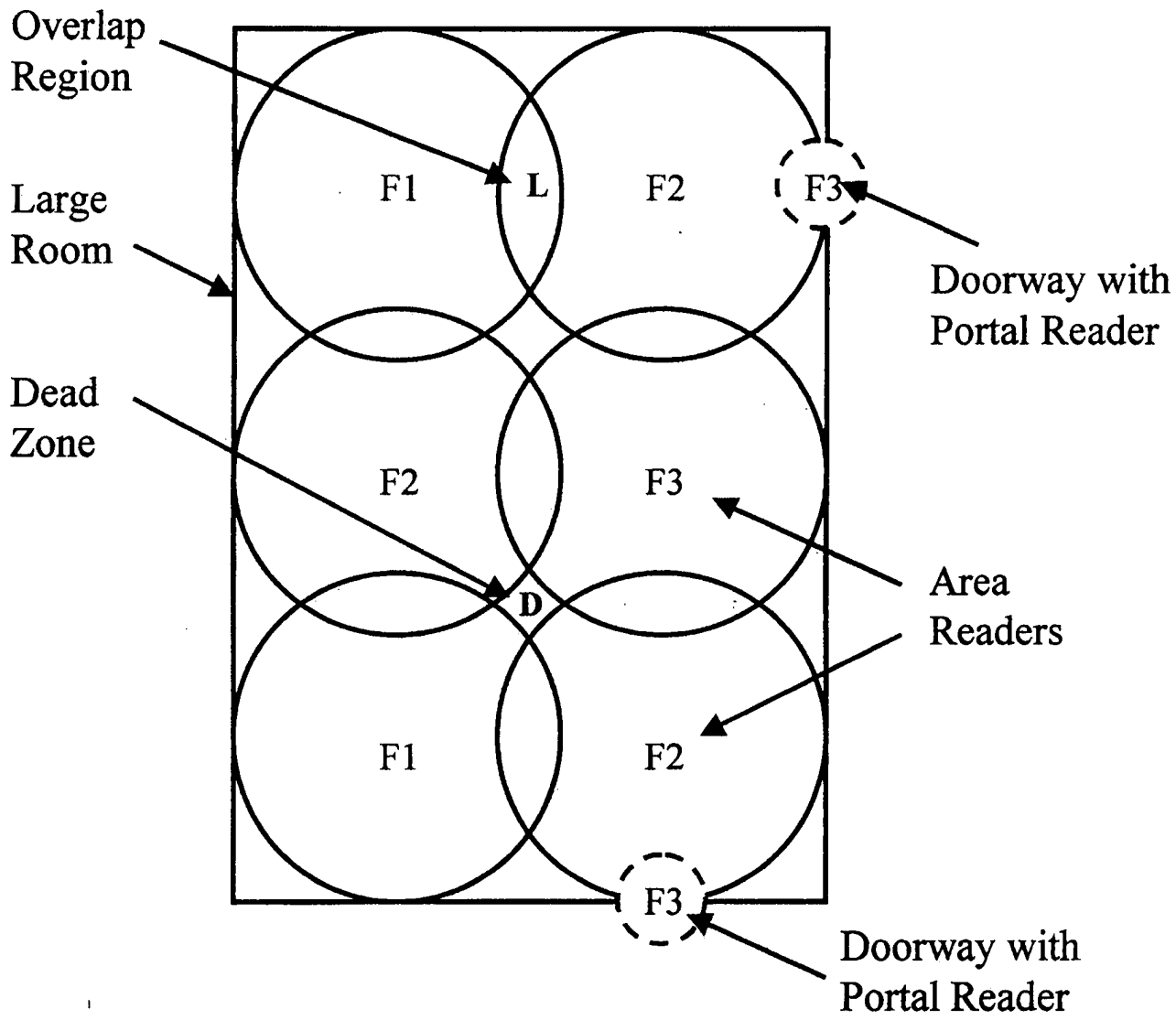

Overlap Region
Large Room
Dead Zone
F1
L
F2
F3
Doorway with Portal Reader
F2
F3
D
Area Readers
F1
F2
F3
Doorway with Portal Reader

Figure 5

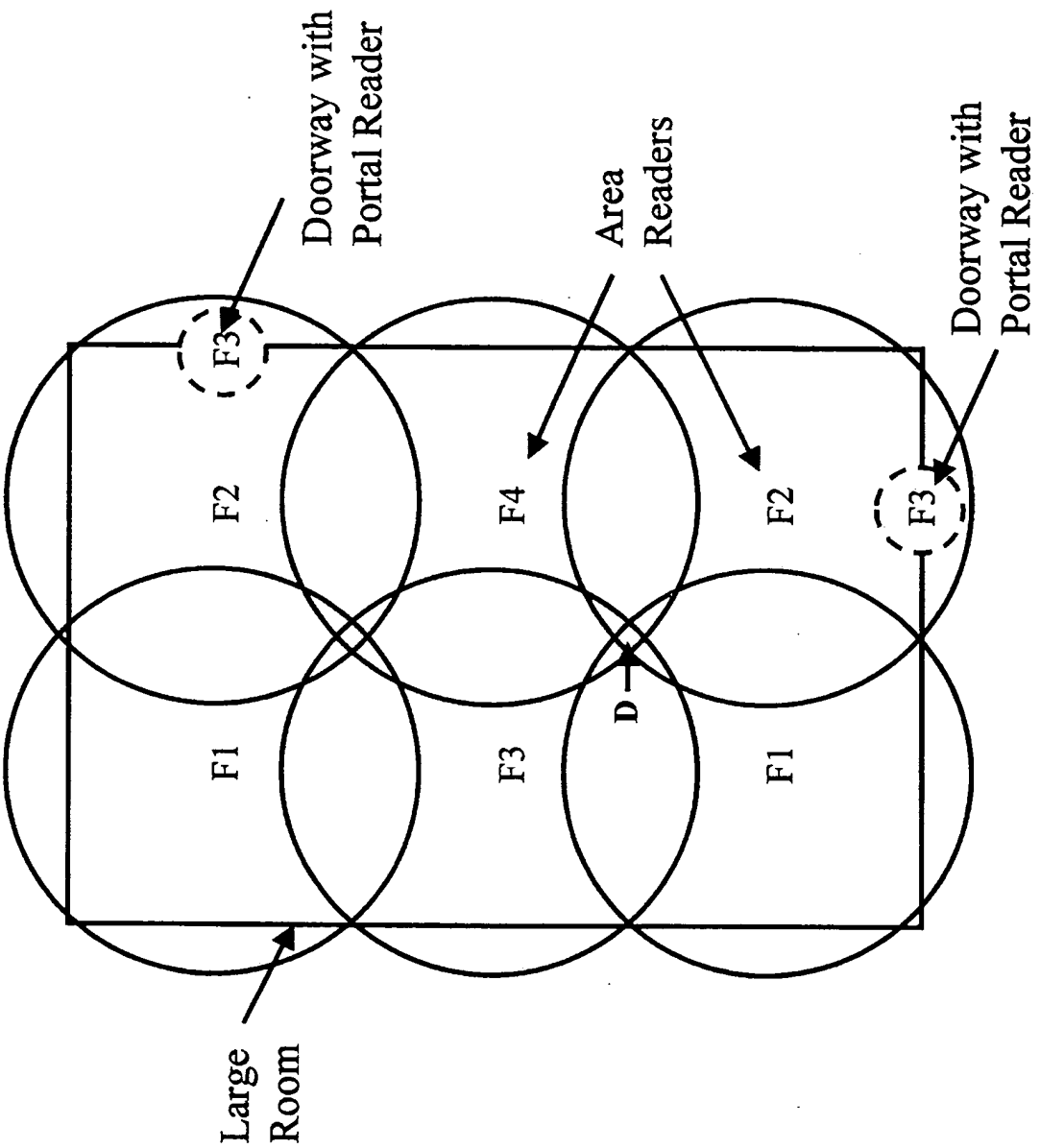

Doorway with Portal Reader
Area Readers
Doorway with Portal Reader
F3
F2
F4
F2
F3
F1
F3
D
F1
Large Room

Figure 6

PET-Tag Main Flow

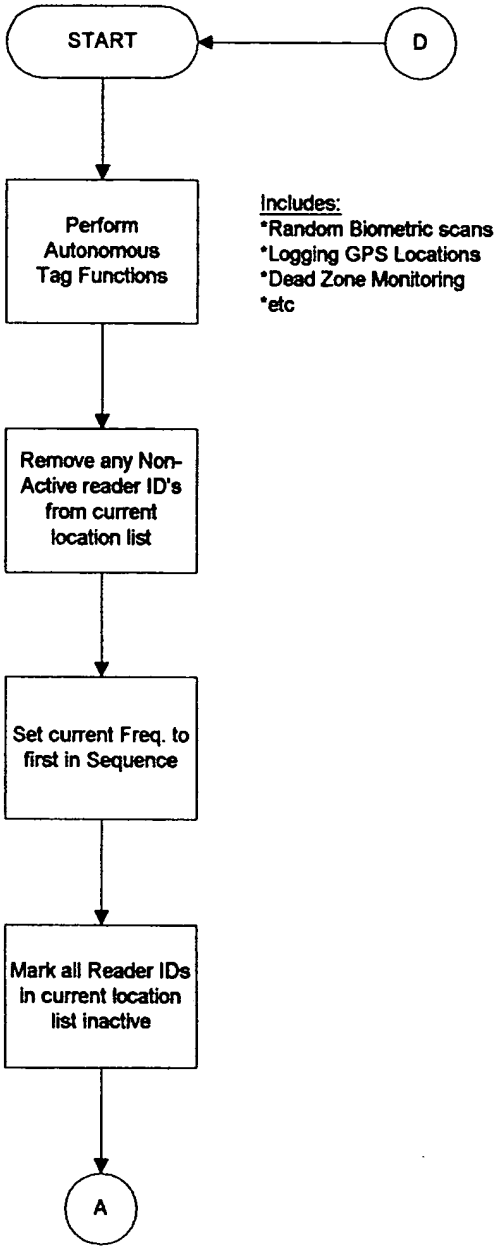


Figure 7

PET-Tag Listen Flow

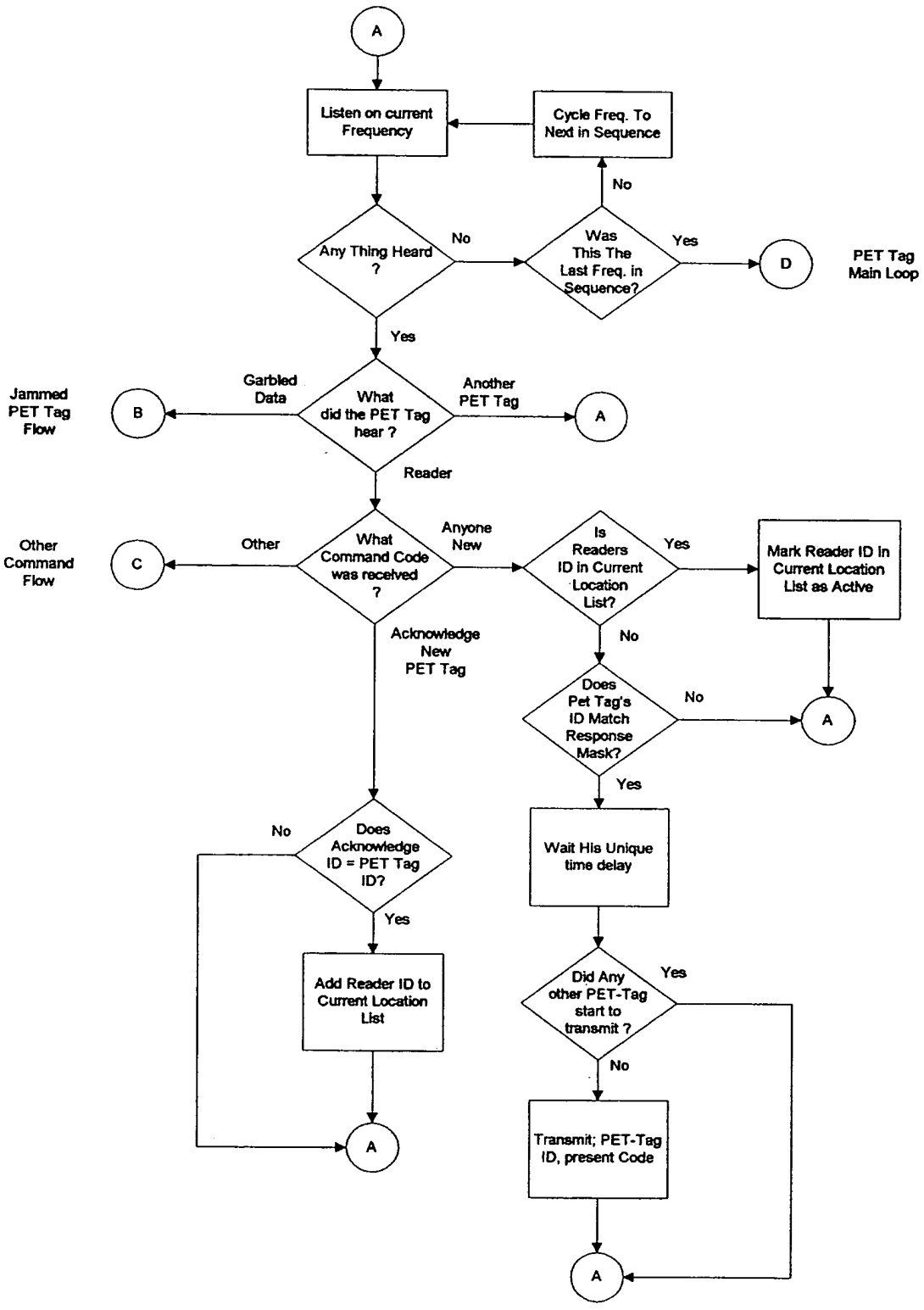
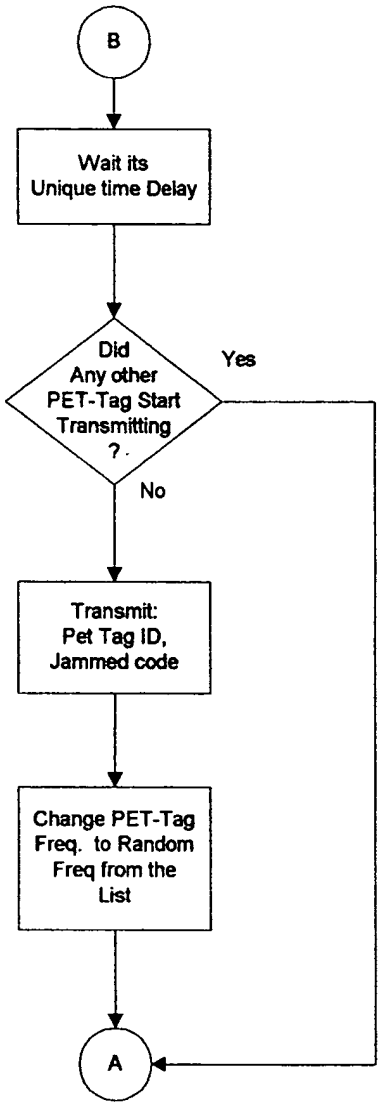


Figure 8

Jammed PET-Tag Flow



PET-Tag Listen Flow

Figure 9

PET-Tag Other Command Flow

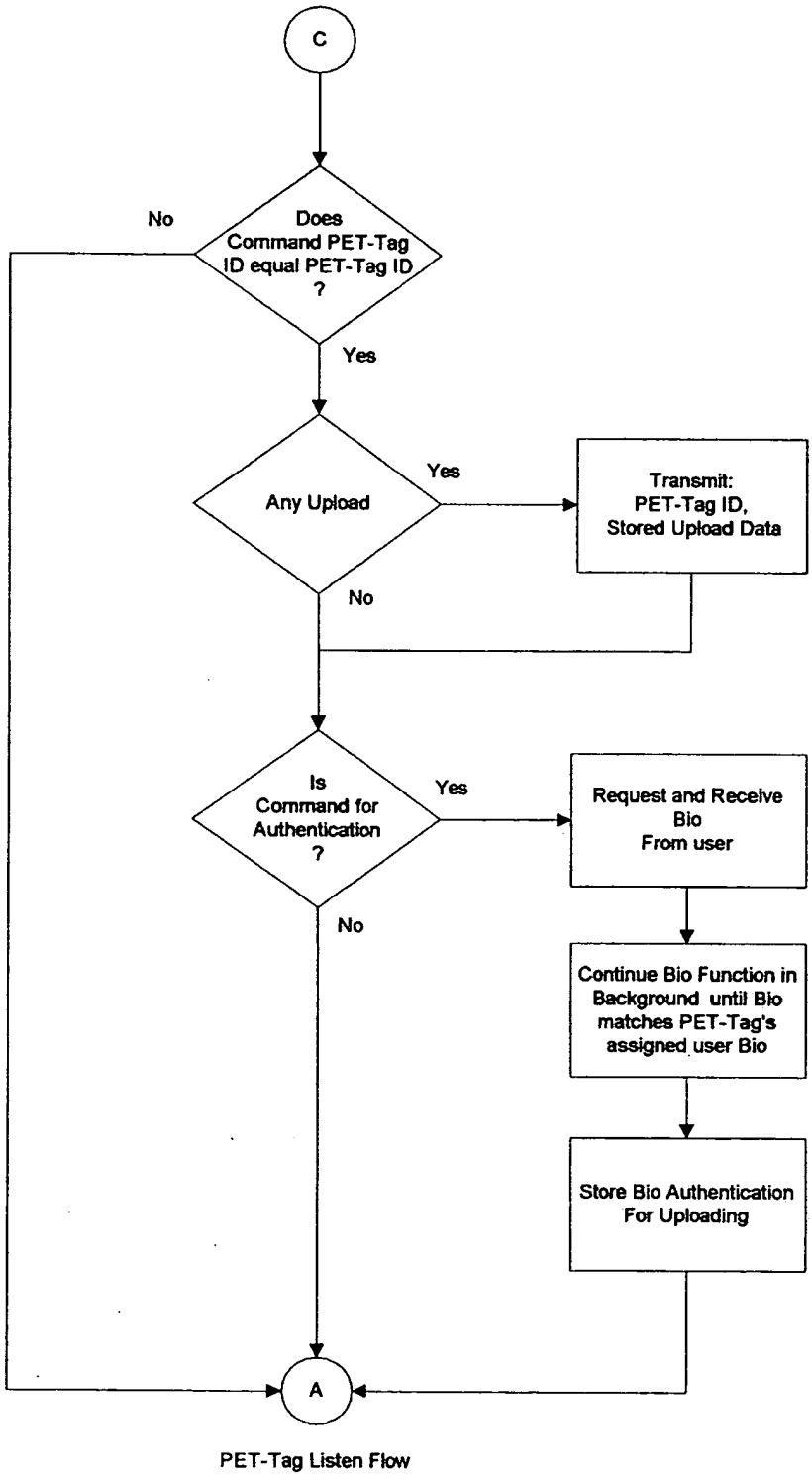


Figure 10

Reader Main Flow

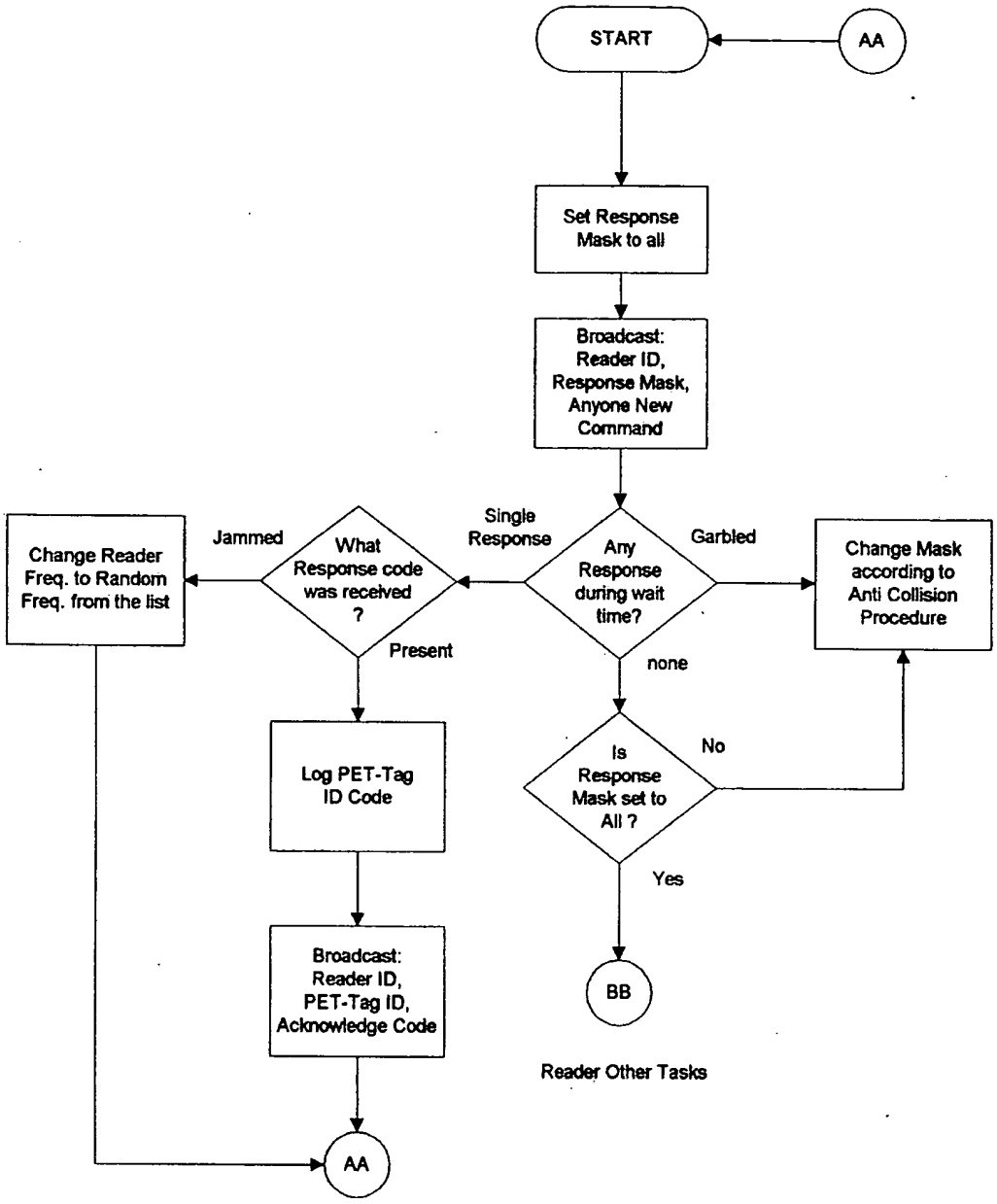
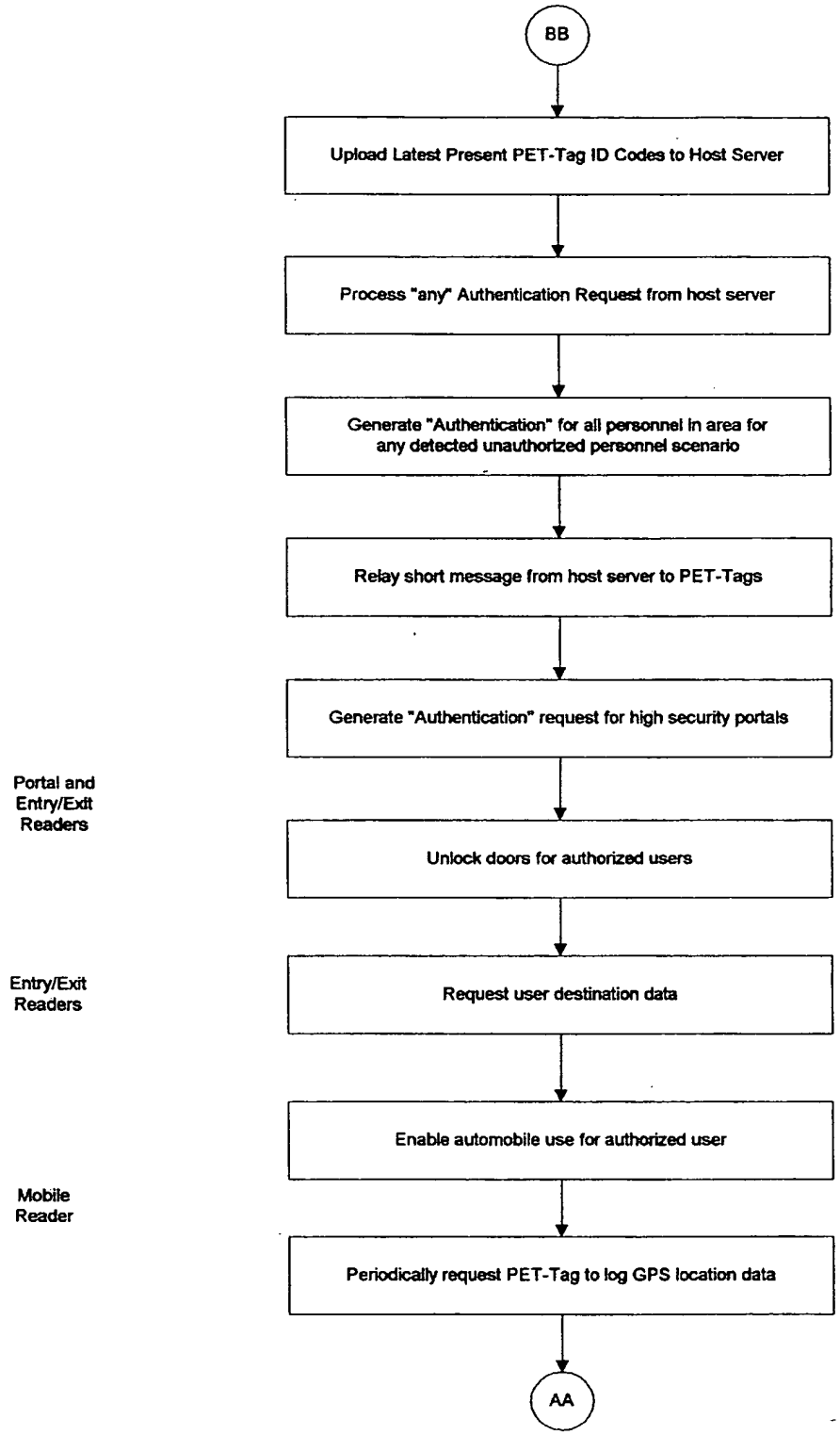


Figure 11

Reader Other Tasks Flow


BB
Upload Latest Present PET-Tag ID Codes to Host Server
Process "any" Authentication Request from host server
Generate "Authentication" for all personnel in area for any detected unauthorized personnel scenario
Relay short message from host server to PET-Tags
Generate "Authentication" request for high security portals
Portal and Entry/Exit Readers
Unlock doors for authorized users
Entry/Exit Readers
Request user destination data
Enable automobile use for authorized user
Mobile Reader
Periodically request PET-Tag to log GPS location data
AA

Reader Main Flow

Figure 12

Single New Entry Scenario

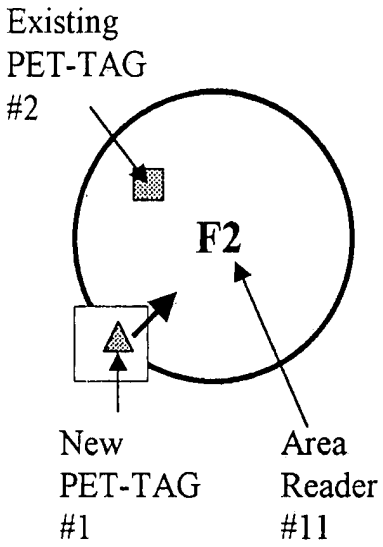


Figure 13

PET-Tag #1	PET-Tag #2	Area Reader #11
(listening on F1)	(listening on F3)	(F2) READER #11, ANYONE NEW
(listening on F1)	(listening on F3)	(listening on F2)
(listening on F2)	(listening on F4)	(F2) READER #11, ANYONE NEW
(waits unique delay)	(listening on F4)	(listening on F2)
(F2) PET-TAG #1, PRESENT	(listening on F1)	(listening on F2)
(listening on F2)	(listening on F1)	(F2) READER #11, PET-TAG #1, ACKNOWLEDGE
(listening on F3)	(listening on F2)	(F2) READER #11, ANYONE NEW
(listening on F3)	(listening on F2)	(listening on F2)
(listening on F4)	(listening on F3)	(listening on F2)
(listening on F4)	(listening on F3)	(F2) READER #11, ANYONE NEW

Double New Entry Scenario

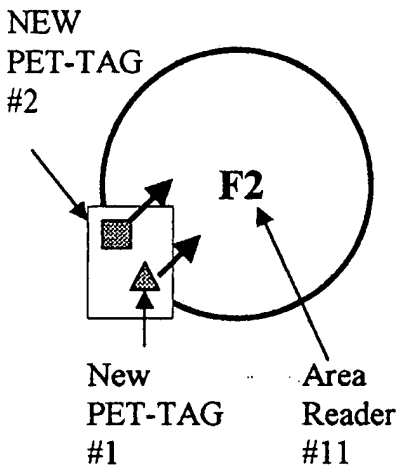


Figure 14

PET-Tag #1	PET-Tag #2	Area Reader #11
(listening on F1)	(listening on F1)	(F2) READER #11, ANYONE NEW
(listening on F1)	(listening on F1)	(listening on F2)
(listening on F2)	(listening on F2)	(F2) READER #11, ANYONE NEW
(waits unique delay)	(waits unique delay)	(listening on F2)
(F2) PET-TAG #1, PRESENT	(still waiting)	(listening on F2)
(listening on F2)	(listening on F2)	(F2) READER #11, PET-TAG #1, ACKNOWLEDGE
(listening on F2)	(listening on F2)	(F2) READER #11, ANYONE NEW
(listening on F2)	(waits unique delay)	(listening on F2)
(listening on F2)	(F2) PET-TAG #2, PRESENT	(listening on F2)
(listening on F2)	(listening on F2)	(F2) READER #11, PET-TAG #2, ACKNOWLEDGE
(listening on F3)	(listening on F3)	(F2) READER #11, ANYONE NEW

Jammed Reader Scenario

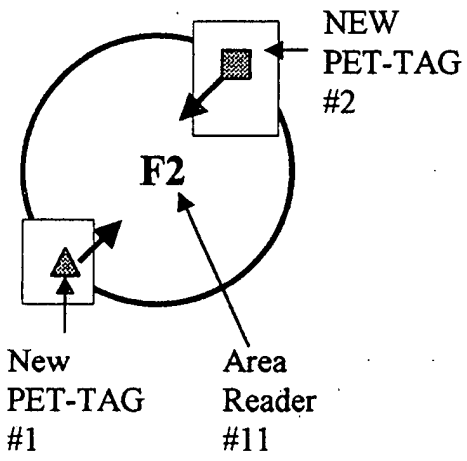


Figure 15

PET-Tag #1	PET-Tag #2	Area Reader #11
(listening on F2)	(listening on F2)	(F2) READER #11, ANYONE NEW
(waits unique delay)	(waits unique delay)	(listening on F2)
(F2) PET-TAG #1, PRESENT	(F2) PET-TAG #2, PRESENT	(listening on F2)
(listening on F2)	(listening on F2)	(F2) READER #11, RESPONSE MASK 'A' ANYONE NEW
(listening on F2)	(waits unique delay)	(listening on F2)
(listening on F2)	(F2) PET-TAG #2, PRESENT	(listening on F2)
(listening on F2)	(listening on F2)	(F2) READER #11, PET-TAG #2, ACKNOWLEDGE
(listening on F2)	(listening on F2)	(F2) READER #11, ANYONE NEW
(waits unique delay)	(listening on F2)	(listening on F2)
(F2) PET-TAG #1, PRESENT	(listening on F2)	(listening on F2)
(listening on F2)	(listening on F2)	(F2) READER #11, PET-TAG #1, ACKNOWLEDGE

Overlapped Reader Scenario

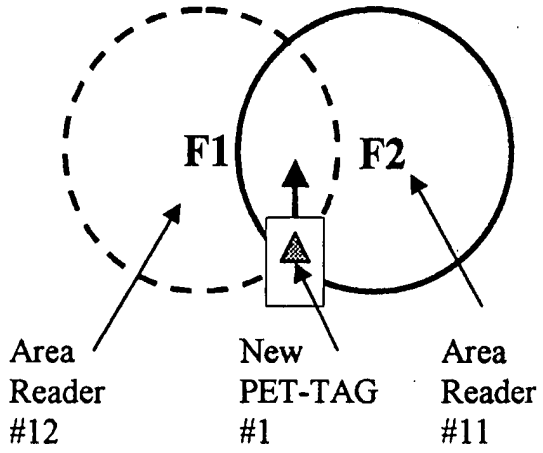
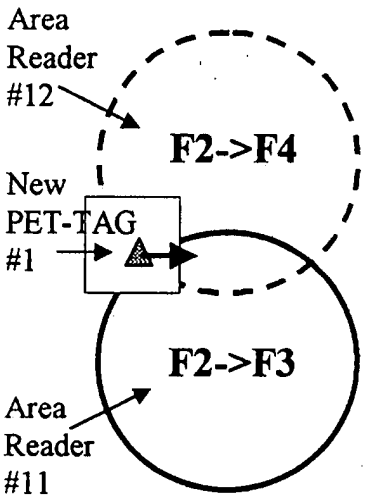


Figure 16

PET-Tag #1	Area Reader #11	Area Reader #12
(listening on F2)	(F2) READER #11, ANYONE NEW	(F1) READER #12, ANYONE NEW
(waits unique delay)	(listening on F2)	(listening on F1)
(F2) PET-TAG #1, PRESENT	(listening on F2)	(listening on F1)
(listening on F2)	(F2) READER #11, PET-TAG #1, ACKNOWLEDGE	(F1) READER #12, ANYONE NEW
(listening on F2)	(F2) READER #11, ANYONE NEW	(listening on F1)
(listening on F3, F4, ...)	(listening on F2)	(listening on F1)
(listening on F1)	(listening on F2)	(F1) READER #12, ANYONE NEW
(waits unique delay)	(F2) READER #11, ANYONE NEW	(listening on F1)
(F1) PET-TAG #1, PRESENT	(listening on F2)	(listening on F1)
(listening on F1)	(listening on F2)	(F1) READER #12, PET-TAG #1, ACKNOWLEDGE
(listening on F1)	(F2) READER #11, ANYONE NEW	(F1) READER #12, ANYONE NEW

Jammed PET-Tag Scenario

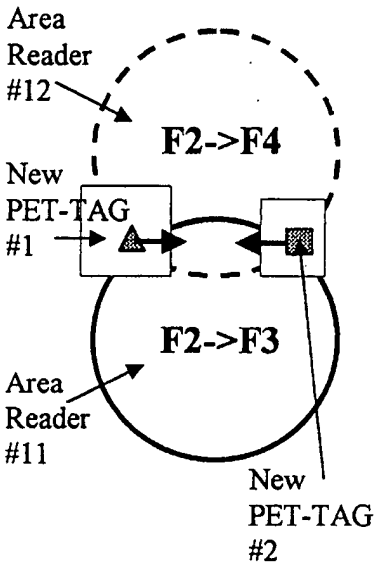


PET-Tag #1	Area Reader #11	Area Reader #12
(listening on F2)	(F2) READER #11, ANYONE NEW	(F2) READER #12, ANYONE NEW
(F2) PET-TAG #1, JAMMED	(listening on F2)	(listening on F2)
(listening on F4)	(F3) READER #11, ANYONE NEW	(F4) READER #12, ANYONE NEW
(waits unique delay)	(listening on F3)	(listening on F4)
(F4) PET-TAG #1, PRESENT	(listening on F3)	(listening on F4)
(listening on F1)	(F3) READER #11, ANYONE NEW	(F4) READER #12, PET-TAG #1, ACKNOWLEDGE
(listening on F2)	(listening on F3)	(F4) READER #12, ANYONE NEW
(listening on F3)	(F3) READER #11, ANYONE NEW	(listening on F4)
(waits unique delay)	(listening on F3)	(listening on F4)
(F3) PET-TAG #1, PRESENT	(listening on F3)	(F4) READER #12, ANYONE NEW
(listening on F3)	(F4) READER #11, PET-TAG #1, ACKNOWLEDGE	(listening on F4)
(listening on F3)	(F3) READER #11, ANYONE NEW	(listening on F4)

Figure 17

Figure 18

Jammed Reader & PET-Tag Scenario



PET-Tag #1	PET-Tag #2	Area Reader #11	Area Reader #12
(listening on F2)	(listening on F2)	(F2) READER #11, ANYONE NEW	(F2) READER #12, ANYONE NEW
(waits unique delay)	(waits unique delay)	(listening on F2)	(listening on F2)
(F2) PET-TAG #1, JAMMED	(F2) PET-TAG #2, JAMMED	(listening on F2)	(listening on F2)
(listening on F3)	(listening on F1)	(F2) READER #11, RESPONSE MASK 'A', ANYONE NEW	(F2) READER #12, RESPONSE MASK 'A', ANYONE NEW
(listening on F3)	(listening on F1)	(listening on F2)	(listening on F2)
(listening on F4)	(listening on F2)	(F2) READER #11, RESPONSE MASK 'B', ANYONE NEW	(F2) READER #12, RESPONSE MASK 'B', ANYONE NEW
(listening on F4)	(F2) PET-TAG #2, JAMMED	(listening on F2)	(listening on F2)
(listening on F1)	(listening on F3)	(F3) READER #11, ANYONE NEW	(F4) READER #12, ANYONE NEW
(listening on F1)	(waits unique delay)	(listening on F3)	(listening on F4)
(listening on F2)	(F3) PET-TAG #2, PRESENT	(listening on F3)	(listening on F4)
(listening on F2)	(listening on F4)	(F3) READER #11, PET-TAG #1, ACKNOWLEDGE	(F4) READER #12, ANYONE NEW
(listening on F3)	(waits unique delay)	(F3) READER #11, ANYONE NEW	(listening on F4)
(waits unique delay)	(F4) PET-TAG #2, PRESENT	(listening on F3)	(listening on F4)
(F3) PET-TAG #1, PRESENT	(listening on F1)	(listening on F3)	(F4) READER #12, PET-TAG #1, ACKNOWLEDGE
(listening on F3)	(listening on F1)	(F3) READER #11, PET-TAG #1, ACKNOWLEDGE	(listening on F4)

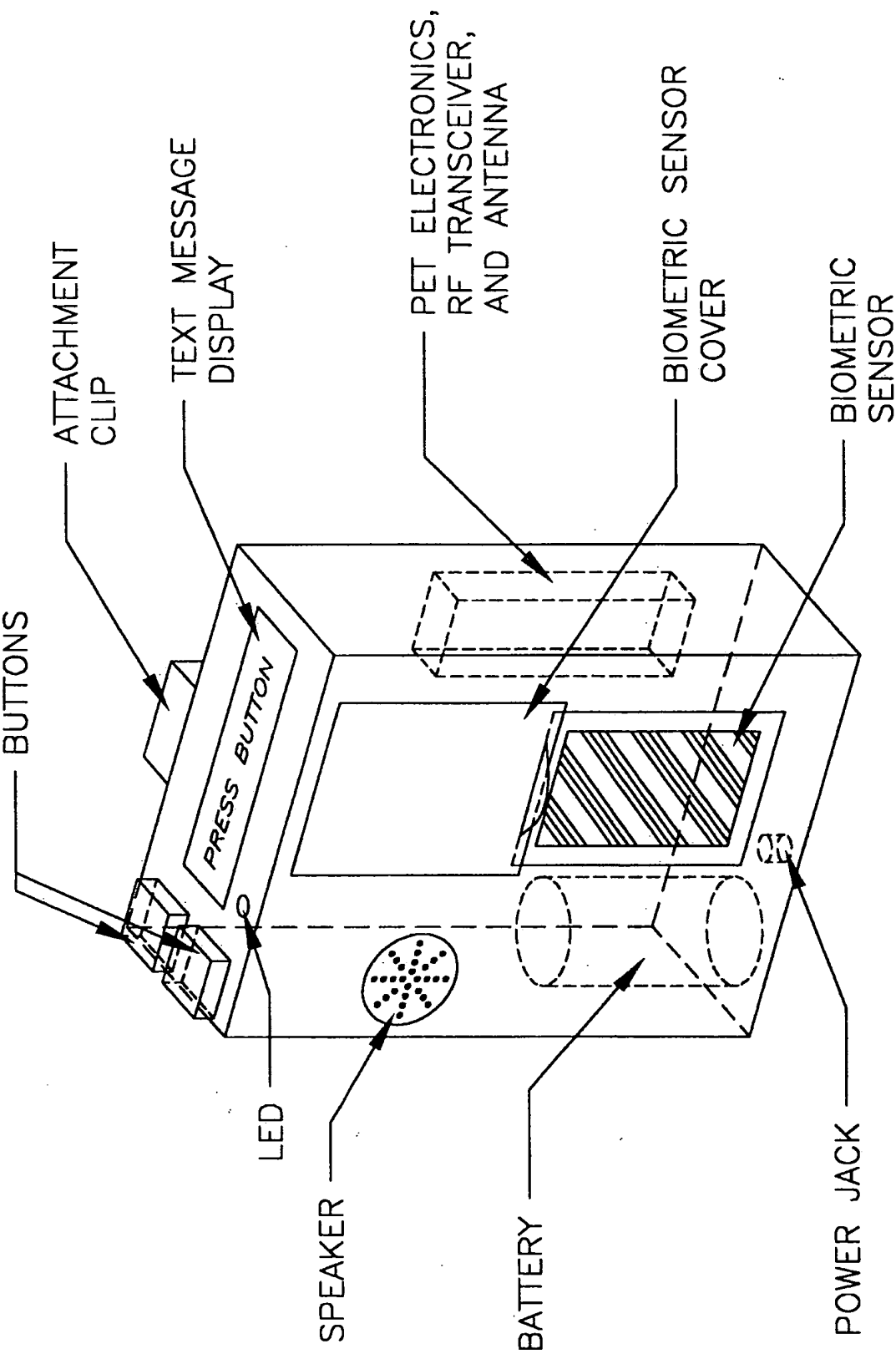

BUTTONS
ATTACHMENT CLIP
TEXT MESSAGE DISPLAY
PET ELECTRONICS, RF TRANSCEIVER, AND ANTENNA
BIOMETRIC SENSOR COVER
BIOMETRIC SENSOR
PRESS BUTTON
LED
SPEAKER
BATTERY
POWER JACK

Figure 19

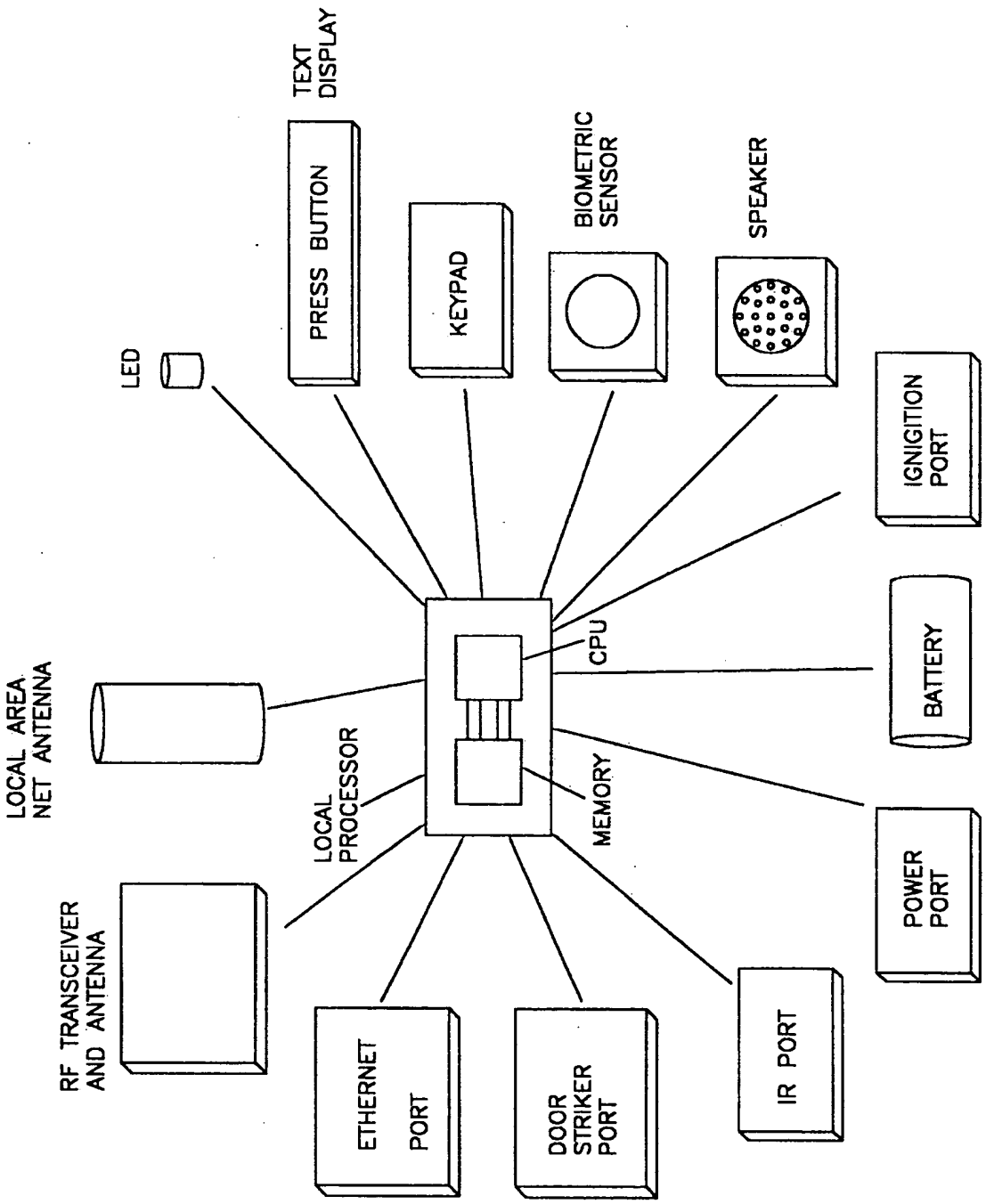

TEXT DISPLAY
PRESS BUTTON
KEYPAD
BIOMETRIC SENSOR
SPEAKER
LED
IGNIGITION PORT
CPU
BATTERY
LOCAL AREA NET ANTENNA
LOCAL PROCESSOR
MEMORY
POWER PORT
RF TRANSCEIVER AND ANTENNA
ETHERNET PORT
DOOR STRIKER PORT
IR PORT

Figure 20

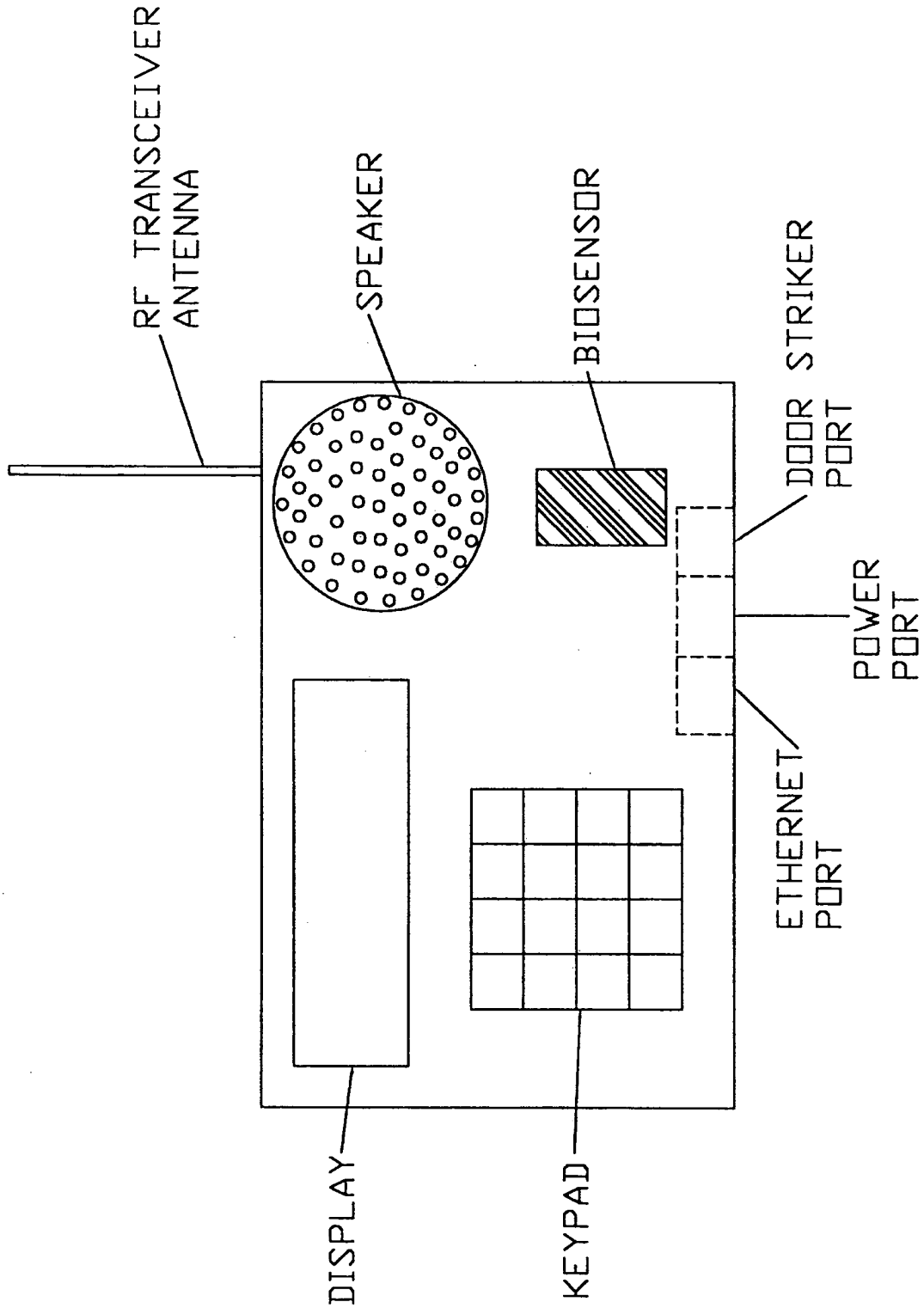

RF TRANSCEIVER ANTENNA
SPEAKER
BIOSENSOR
DOOR STRIKER PORT
POWER PORT
ETHERNET PORT
DISPLAY
KEYPAD

Figure 21